

AD 753 204

LIBRARY
TECHNICAL REPORT SECTION
NAVAL POSTGRADUATE SCHOOL
MONTEREY, CALIFORNIA 93940

AD

**NAVAL PERSONNEL AND TRAINING
RESEARCH LABORATORY
SAN DIEGO, CALIFORNIA 92152**

RESEARCH MEMORANDUM SRM 73-2

OCTOBER 1972

THE NAVY ADJECTIVE LIST AS A PREDICTOR OF ENLISTED RETENTION

**Norman M. Abrahams
Lynn A. Lacey**

APPROVED FOR PUBLIC RELEASE;
DISTRIBUTION UNLIMITED.





DEPARTMENT OF THE NAVY
NAVAL PERSONNEL AND TRAINING
RESEARCH LABORATORY
SAN DIEGO, CALIFORNIA 92152

IN REPLY REFER TO:

52:tr
521.007.01.07
Ser: 738
24 November 1972

From: Commanding Officer
To: Distribution List

Subj: Research on the Navy Adjective List as a predictor of enlisted retention; forwarding of report on

Encl: (1) Research Memorandum SRM 73-2, "The Navy Adjective List as a Predictor of Enlisted Retention," October 1972

1. This Laboratory has conducted the subject research under the direction of the Chief of Naval Personnel (Pers-A3). Copies of the research memorandum are forwarded as enclosure (1) for information and retention.

2. For the convenience of those not having the time or need to read the entire report, a summary providing an overview of the research is attached to each report.

F. L. Nelson
F. L. NELSON

Distribution:

Chief of Naval Operations (OP-39) (OP-59) (OP-098T) (OP-098TL) (2)
(OP-987F) (OP-099) (2) (OP-964)

Chief of Naval Personnel (Pers-A) (Pers-A1) (Pers-A2) (Pers-A3 w/4
Library Index Cards and 3 copies) (Pers-A32 w/8 copies) (Pers-B)
(Pers-B2t) (Pers-P) (Pers-Pl) (Pers-11b w/4 Library Index Cards and
3 copies)

Office of Naval Research (Code 458) (2)

Assistant Secretary of Navy for Manpower and Reserve Affairs (2)

Office of Assistant Secretary of Defense (M&RA)

Commander, Navy Recruiting Command (00) (015) (20) (312) (314)

Commanding Officer, Personnel Research and Development Laboratory

Chief, Naval Technical Training (Code 75), Memphis

Chief of Naval Training (Code 017), Pensacola

Commander and Director, Naval Electronics Laboratory Center, San Diego

Commanding Officer, Navy Medical Neuropsychiatric Research Unit,
San Diego

Commanding Officer, Naval Aerospace Medical Institute, Pensacola (2)

Commanding Officer, Naval Examining Center, Great Lakes (2)

Commanding Officer, Naval Submarine Medical Center, Groton (2)

52:tr
521.007.01.07
Ser: 738
24 November 1972

Distribution (cont'd)

Commanding Officer, Naval Medical Research Institute, Bethesda
Center for Naval Analyses, Arlington
Commander, Personnel Research Division, Air Force Human Resources
Laboratory, Lackland Air Force Base, Texas (2)
U. S. Army Enlisted Evaluation Center, Fort Benjamin Harrison (2)
Assistant Chief of Staff (G-1), U. S. Marine Corps, Washington, D. C.
Commandant (Code B-5), U. S. Coast Guard
U. S. Army Behavior and Systems Research Laboratory, Arlington
→ Superintendent, Naval Postgraduate School, Monterey
Superintendent, Naval Academy, Annapolis
U. S. Military Academy, West Point, New York
Superintendent, U. S. Air Force Academy, Colorado
National Research Council, Washington, D. C.
National Science Foundation, Washington, D. C.
Director, Defense Documentation Center, Alexandria (12)

Abrahams, N. M., & Lacey, L. A. The Navy Adjective List as a predictor of enlisted retention. San Diego, CA: Naval Personnel and Training Research Laboratory, October 1972. (Research Memorandum SRM 73-2, 521.007.01.07)

SUMMARY

A. Problem

The heavy loss of highly trained and experienced naval personnel who fail to reenlist continues to be a major personnel problem.

B. Approach

One approach to reducing the impact of turnover is to place men with the greatest likelihood of reenlistment in assignments which are most critical and for which training is most expensive. The present research evaluates the effectiveness of an experimental test, the Navy Adjective List (NAL), in identifying men with superior reenlistment likelihood. The relationship between several types of NAL scale scores and subsequent career decisions was determined for a sample of 390 men who had been tested as recruits.

C. Results

Empirical keys developed from NAL responses had limited value in predicting retention. However, rational scales measuring anxiety, achievement, and social desirability were moderately effective individually and in combination.

D. Conclusions and Recommendations

The results of this study suggest the adjective check list approach to have some value in predicting tenure. It is planned to refine and expand the scales measuring the psychological dimensions found most effective. Experimental administration to a sample of enlisted personnel near the end of their first enlistment will permit evaluation of the new scales.

UNCLASSIFIED

Security Classification

DOCUMENT CONTROL DATA - R & D

Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1 ORIGINATING ACTIVITY (Corporate author) Naval Personnel & Training Research Laboratory San Diego, California 92152		2a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED	
		2b. GROUP	
3 REPORT TITLE THE NAVY ADJECTIVE LIST AS A PREDICTOR OF ENLISTED RETENTION			
4 DESCRIPTIVE NOTES (Type of report and inclusive dates) Final			
5 AUTHOR(S) (First name, middle initial, last name) Norman M. Abrahams and Lynn A. Lacey			
6 REPORT DATE October 1972		7a. TOTAL NO. OF PAGES 14	7b. NO. OF REFS 3
8a. CONTRACT OR GRANT NO.		9a. ORIGINATOR'S REPORT NUMBER(S) SRM 73-2	
b. PROJECT NO. 521.007.01.07			
c.		9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)	
d.			
10. DISTRIBUTION STATEMENT Approved for public release; distribution unlimited			
11. SUPPLEMENTARY NOTES		12. SPONSORING MILITARY ACTIVITY Chief of Naval Personnel (Pers-A3) Department of the Navy Washington, D. C. 20370	
13. ABSTRACT <p>The heavy loss of highly trained and experienced naval personnel who fail to reenlist continues to be a major personnel problem.</p> <p>One approach to reducing the impact of turnover is to place men with the greatest likelihood of reenlistment in assignments which are most critical and for which training is most expensive. The present research evaluates the effectiveness of an experimental test, the Navy Adjective List (NAL), in identifying men with superior reenlistment likelihood. The relationship between several types of NAL scale scores and subsequent career decisions was determined for a sample of 390 men who had been tested as recruits.</p> <p>Empirical keys developed from NAL responses had limited value in predicting retention. However, rational scales measuring anxiety, achievement, and social desirability were moderately effective individually and in combination.</p> <p>The results of this study suggest the adjective check list approach to have some value in predicting tenure. It is planned to refine and expand the scales measuring the psychological dimensions found most effective. Experimental administration to a sample of enlisted personnel near the end of their first enlistment will permit evaluation of the new scales.</p>			

DD FORM 1473 (PAGE 1)

1 NOV 65

S/N 0101-807-6801

UNCLASSIFIED

Security Classification

Security Classification

DD FORM 1 NOV 65 1473 (BACK)
(PAGE 2)

Security Classification

AD

THE NAVY ADJECTIVE LIST AS A PREDICTOR
OF ENLISTED RETENTION

Norman M. Abrahams
Lynn A. Lacey

October 1972

521.007.01.07
Research Memorandum SRM 73-2

Submitted by

B. Rimland, Ph.D., Director, Personnel Measurement Research Department

Approved by

E. I. Jones, Ph.D., Technical Director
F. L. Nelson, Captain, USN
Commanding Officer

Approved for public release; distribution unlimited

Naval Personnel and Training Research Laboratory
San Diego, California 92152

A LABORATORY OF THE BUREAU OF NAVAL PERSONNEL

SUMMARY

A. Problem

The heavy loss of highly trained and experienced naval personnel who fail to reenlist continues to be a major personnel problem.

B. Approach

One approach to reducing the impact of turnover is to place men with the greatest likelihood of reenlistment in assignments which are most critical and for which training is most expensive. The present research evaluates the effectiveness of an experimental test, the Navy Adjective List (NAL), in identifying men with superior reenlistment likelihood. The relationship between several types of NAL scale scores and subsequent career decisions was determined for a sample of 390 men who had been tested as recruits.

C. Results

Empirical keys developed from NAL responses had limited value in predicting retention. However, rational scales measuring anxiety, achievement, and social desirability were moderately effective individually and in combination.

D. Conclusions and Recommendations

The results of this study suggest the adjective check list approach to have some value in predicting tenure. It is planned to refine and expand the scales measuring the psychological dimensions found most effective. Experimental administration to a sample of enlisted personnel near the end of their first enlistment will permit evaluation of the new scales.

REPORT USE AND EVALUATION

Feedback from consumers is a vital element in improving products so that they better respond to specific needs. To assist the Chief of Naval Personnel in future planning, it is requested that the use and evaluation form on the reverse of this page be completed and returned. The page is preaddressed and franked; fold in thirds, seal with tape, and mail.

Department of the Navy

Postage and Fees Paid
Navy Department

Official Business

Chief of Naval Personnel (Pers-A3)
Department of the Navy
Washington, D. C. 20370

Report Title & No.: THE NAVY ADJECTIVE LIST AS A PREDICTOR OF
ENLISTED RETENTION (SRM 73-2)

1. Evaluation of Report. Please check appropriate column.

FACTORS	RATING			COMMENTS
	LOW	AVG	HIGH	
Usefulness of Data				
Timeliness				
Completeness				
Technical Accuracy				
Validity of Recommendations				
Soundness of Approach				
Presentation and Style				
Other				

2. Use of Report. Please fill in answers as appropriate.

- a. What are your main uses for the material contained in the report?
- b. What changes would you recommend in report format to make it more useful?
- c. What types of research would be most useful to you for the Chief of Naval Personnel to conduct?
- d. Do you wish to remain on our distribution list?
- e. Please make any general comments you feel would be helpful to us in planning our research program.

NAME: _____ CODE: _____

ORGANIZATION: _____

ADDRESS: _____

CONTENTS

	Page
A. PROBLEM AND BACKGROUND	1
B. PROCEDURE	
1. Sample	1
2. Instrument	1
3. Analyses	2
C. RESULTS AND DISCUSSION	2
D. SUMMARY AND CONCLUSIONS	3
References	6

TABLES

1. Means, Standard Deviations, and Validities of Empirically-Derived Key Developed on Total Sample	4
2. Means, Standard Deviations, and Validities of Empirically-Derived Key Developed on Sample Excluding Six-Year Obligors	4
3. Regression Analyses for the Rational Scales	5

THE NAVY ADJECTIVE LIST AS A PREDICTOR OF ENLISTED RETENTION

A. PROBLEM AND BACKGROUND

The purpose of this research is to evaluate the Navy Adjective List (NAL) for possible use in the selection and classification of enlisted men as a means of increasing the Navy's retention rate. The NAL, developed to measure "need for achievement," was found to predict language school performance when empirically keyed (Neumann, Abrahams, & Githens, 1968). However, Lau, Lacey, and Abrahams (1970) did not find the empirical keys on the NAL to be effective in predicting achievement of Navy enlisted personnel at a number of other schools. The present research evaluates the NAL against a reenlistment criterion for a Navy recruit sample.

B. PROCEDURE

1. Sample

The present sample consisted of 390 enlisted men who were tested during recruit training and followed up at the end of their first enlistment status. Two criterion groups were identified. The high tenure group consisted of 53 men who either reenlisted or extended their first enlistments 12 months or more. Those who had initially obligated themselves for six years of service ($n = 23$) were considered high tenure in some of the analyses. The low tenure group consisted of 314 men who were no longer on active duty.

2. Instrument

The NAL contains 110 adjectives such as "competitive," "tolerant," "friendly," "shy," "dominant," etc., to each of which the respondent makes one of the following responses:

N = Does Not apply to me.

A = Accurately applies to me.

L = Applies to me a Little.

The respondents were instructed to cross out those adjectives that they did not understand.

3. Analyses

Two empirical keys were constructed from the NAL to predict retention status. The first was developed and cross-validated with six-year obligors included in the high tenure sample, the second key was developed and cross-validated excluding six-year obligors. For both scales approximately two-thirds of each sample was used for construction of keys and one-third was used for cross-validation of the keys. In each case all item responses having a percent difference of 13 or greater were selected for the scoring keys. Weights of +1 were assigned to those responses more often selected by reenlistees and weights of -1 to those responses more often selected by non-reenlistees.

In addition to the empirical keys, the samples were scored on the following four scales derived from a rational clustering of adjectives: Achievement, Anxiety, and Positive and Negative Desirability. The Achievement scale consisted of 53 achievement-oriented adjectives. The Anxiety scale consisted of 29 anxiety-oriented adjectives. For each of these two scales, adjectives endorsed with an 'A' (accurately applies) received a weight of two; those endorsed with an 'L' (applies a little) a weight of one; and those responded to with 'N' (does not apply) a weight of zero. Scores were then computed by summing the weights assigned to each response to the adjectives included in each scale.

To develop the Positive and Negative Social Desirability scales five judges rated all adjectives on these dimensions. The Negative Desirability scale consisted of the 35 adjectives that were rated least desirable by the five judges and the Positive Desirability scale included the 40 adjectives considered most socially desirable. For each of these scales, adjectives endorsed with an 'A' received a weight of twice the average desirability rating of the adjective; each adjective endorsed with an 'L' received the average desirability rating as a weight; and each adjective endorsed with an 'N' received no weight.

Two matrices containing the intercorrelations between retention status and the four rationally-derived scales were computed. The first matrix was based on the total sample while the second was based on the total sample excluding six-year obligors. From each matrix multiple-regression equations were computed for the four scales.

C. RESULTS AND DISCUSSION

Tables 1 and 2 present means, standard deviations, and biserial¹ correlations of the empirically developed key with the retention criterion for both the key development and the cross-validation samples. Percentage overlap figures are also presented. The difference between the means of the high and low tenure cross-validation groups that included six-year

¹The dichotomous retention criterion is assumed to have an underlying continuous distribution.

obligors was statistically significant ($t = 2.67, p < .01$), indicating that the empirically-derived NAL scores differentiated between the high and low tenure groups. This scale yielded a biserial validity of .42 on cross-validation. However, when the six-year obligors were excluded from the validation and cross-validation samples the difference between the means of the high and low tenure cross-validation groups was sharply reduced and not statistically significant. Thus, the apparent validity of the first key appears to be due solely to the inclusion of the six-year obligors in the high tenure sample, and as such, provides no practical contribution to prediction. Nevertheless, these findings indicate that six-year obligors are discriminable from low tenure men in terms of their adjective self-descriptions.

Table 3 presents validities, Beta weights, and multiple correlations of the four rationally-derived scales for the two samples. The single most valid predictor among the rationally-derived scales for the total sample was the Anxiety scale, with a biserial correlation of $-.33 (p < .01)$ with retention status. The moderately high negative validity of this scale indicates the greater the number of anxiety adjectives a man endorsed as descriptive of himself, the less likely he is to reenlist. When Achievement scale scores and Positive Desirability scale scores were combined with Anxiety scores, the multiple correlation increased by 10 correlation points ($p < .001$). This multiple of .43 decreased to .38 when corrected for estimated shrinkage. The most valid predictor for the sample excluding six-year obligors was again the Anxiety scale, with a validity of $-.25$. Again, Achievement and Positive Desirability scale scores contributed to a significantly increased multiple correlation of .34 which reduced to .26 ($p < .01$) when corrected for shrinkage.

The moderate validity obtained by the rational scale scores for the sample excluding six-year obligors and the lack of validity for the empirically-constructed key is somewhat paradoxical. This finding appears to be due to lowness of the validities of the items on the rational scales that precluded their selection for the empirical keys which used a relatively rigorous criterion for item inclusion.

Although the Positive Desirability scale had low zero-order validity for each sample, it contributed quite significantly to the multiple correlation. Apparently, this scale operates as a suppressor variable, partialling out from Achievement scale scores those factors unrelated to the retention criterion. That is, the addition of Positive Desirability scores to the multiple-regression equations apparently allows the tendency for the subjects to describe themselves in a socially desirable manner to be partialled out from Achievement scores. These findings provide leads which may prove useful in future research.

D. SUMMARY AND CONCLUSIONS

This study investigated the utility of the NAL in predicting the retention status of naval recruits.

TABLE 1

Means, Standard Deviations, and Validities of Empirically-Derived
Key Developed on Total Sample

Sample	N	\bar{X}	S.D.	r_b	Percentage Overlap
<u>Key Construction</u>					
High Tenure	54	9.78	11.92	.75	50
Low Tenure	215	-3.60	7.74		
- - - - -					
<u>Cross Validation</u>					
High Tenure	22	5.50	11.09	.42**	72
Low Tenure	99	-1.14	7.74		

**Significant beyond the .01 level (Alf & Abrahams, 1971).

TABLE 2

Means, Standard Deviations, and Validities of Empirically-Derived
Key Developed on Sample Excluding Six-Year Obligors

Sample	N	\bar{X}	S.D.	r_b	Percentage Overlap
<u>Key Construction</u>					
High Tenure	40	15.35	10.96	.68	54
Low Tenure	215	3.60	8.39		
- - - - -					
<u>Cross Validation</u>					
High Tenure	13	5.54	6.59	-.03	97
Low Tenure	99	6.06	7.83		

TABLE 3

Regression Analyses for the Rational Scales

Predictor Scale	Total Sample		Without Six-Year Obligators	
	Validity	Beta Weight	Validity	Beta Weight
Achievement	.11	.78*	.12	.61*
Anxiety	-.33	-.25*	-.25	-.25*
Positive Desirability	.06	-.74*	.08	-.56*
Negative Desirability	-.29	.00	-.20	.07
Multiple R_{bis}	.43		.34	
Shrunken R_{bis}	.38		.26	

Note.--

*Indicates the scales which contributed significantly ($p \leq .01$) and were used in computing multiple correlations.

Empirical keys were constructed and cross-validated on a sample of Navy enlisted men. The first empirical key, developed on the sample including six-year obligors, was moderately correlated with the retention criterion. However, upon excluding six-year obligors, no relationship with reenlistment status was found.

The samples were also scored on four rationally-derived scales measuring positive and negative social desirability as well as anxiety and need for achievement. For the samples including six-year obligors, the validity of a linear combination of rational scale scores was virtually the same as the empirical scale in predicting retention. However, the rational scales, individually and in combination, were superior to the empirical scale for the sample excluding six-year obligors. Since the rationally-derived scales were moderately related to retention in both analyses, they appear to be more useful than the empirical scales.

It is planned to revise the NAL to refine the valid dimensions and then administer it to a larger sample of naval recruits for subsequent validation with a retention criterion. Since the retention criterion requires at least four years to mature, interim validity will be estimated by administering the NAL to a group of naval personnel whose obligated service is near completion.

REFERENCES

- Alf, E., & Abrahams, N. A significance test for biserial r. Educational and Psychological Measurement, 1971, 31, 637-640.
- Lau, A. W., Lacey, L., & Abrahams, N. M. A non-cognitive test battery as a predictor of Class "A" school performance. San Diego: Naval Personnel and Training Research Laboratory, March 1970. (Technical Bulletin STB 70-5)
- Neumann, I., Abrahams, N. M., & Githens, W. H. Selection of military personnel for foreign language training. San Diego: U. S. Naval Personnel Research Activity, September 1968. (Research Report SRR 69-6)

DISTRIBUTION LIST

Chief of Naval Operations (OP-39) (OP-59) (OP-098T) (OP-098TL) (2)
(OP-987F) (OP-099) (2) (OP-964)

Chief of Naval Personnel (Pers-A) (Pers-A1) (Pers-A2) (Pers-A3 w/4
Library Index Cards and 3 copies) (Pers-A32 w/8 copies) (Pers-B)
(Pers-B2t) (Pers-P) (Pers-P1) (Pers-11b w/4 Library Index Cards and
3 copies)

Office of Naval Research (Code 458) (2)

Assistant Secretary of Navy for Manpower and Reserve Affairs (2)

Office of Assistant Secretary of Defense (M&RA)

Commander, Navy Recruiting Command (00) (015) (20) (312) (314)

Commanding Officer, Personnel Research and Development Laboratory

Chief, Naval Technical Training (Code 75), Memphis

Chief of Naval Training (Code 017), Pensacola

Commander and Director, Naval Electronics Laboratory Center, San Diego

Commanding Officer, Navy Medical Neuropsychiatric Research Unit, San
Diego

Commanding Officer, Naval Aerospace Medical Institute, Pensacola (2)

Commanding Officer, Naval Examining Center, Great Lakes (2)

Commanding Officer, Naval Submarine Medical Center, Groton (2)

Commanding Officer, Naval Medical Research Institute, Bethesda

Center for Naval Analyses, Arlington

Commander, Personnel Research Division, Air Force Human Resources
Laboratory, Lackland Air Force Base, Texas (2)

U. S. Army Enlisted Evaluation Center, Fort Benjamin Harrison (2)

Assistant Chief of Staff (G-1), U. S. Marine Corps, Washington, D. C.

Headquarters, U. S. Marine Corps (Code A01B), Washington, D. C.

Commandant (Code B-5), U. S. Coast Guard

U. S. Army Behavior and Systems Research Laboratory, Arlington

Superintendent, Naval Postgraduate School, Monterey

Superintendent, Naval Academy, Annapolis

U. S. Military Academy, West Point, New York

Superintendent, U. S. Air Force Academy, Colorado

National Research Council, Washington, D. C.

National Science Foundation, Washington, D. C.

Director, Defense Documentation Center, Alexandria (12)

2000

1

2000

U14973

